

## A Synopsis of the Harvest-Spiders (Phalangiidae) of South Dakota.

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I am indebted to Messrs. J. M. Aldrich and T. A. Williams for an interesting collection of harvest-spiders from certain points in South Dakota, chiefly Brookings and Custer. These specimens on the whole are peculiar, because of the shortness of the legs and the tendency to melanism. Possibly the former may be due to the fact that in a prairie country long legs are less useful than in a wooded region; this seems especially likely, in view of the fact that, while out-door forms have very short legs, *P. cinereum*, which lives in sheds and about houses, has legs of normal length.

With the exception of the male *Trachyrhinus favosus* and *Liobunum* (?) *calcar*, the measurements given below are from South Dakota specimens.

### Family PHALANGIIDÆ.

Teguments soft or coriaceous. Five or six ventral segments; the first very large and prolonged cephalad between the coxæ. Anal piece unique or accompanied by two small lateral pieces. Two eyes situated upon a tubercle, always separated from the anterior border. Two transverse striæ on the cephalothorax back of the eye-eminence. Lateral borders of coxæ free; maxillary lobe of second pair always visible. Palpi elongate; tarsus longer than tibia, terminated by a claw. Legs similar to each other; tarsi multi-articulate (Simon).

Two subfamilies are represented in the collections at hand. They may be distinguished as follows:

Body very hard and greatly roughened by reticulations or tubercles.

Mesosomatinae.

Body soft or subcoriaceous, not much roughened by reticulations or tubercles.

Phalangiinae.

### Subfamily MESOSOMATINÆ.

Body very hard, most of the dorsal segments being united in a firm, dense plate; much roughened by tubercles or reticulations. In the males the posterior dorsal and the ventral abdominal segments

have their margins developed into thin overlapping plates. Pores on margin of cephalothorax distinct. Anal piece unique; maxillary lobe of palpi with two tubercles.

The two genera of this subfamily are easily separated by the following characters:

Fourth legs as long as second legs, or nearly so.....**Mesosoma.**  
Fourth legs distinctly shorter than second legs.....**Trachyrhinus.**

### **MESOSOMA** Weed, 1892.

Dorsum a firm hard plate, thickly studded with small, hemispherical tubercles. Eye-eminence of nearly equal height, length and breadth; not carinated. Palpi moderately robust, not branched, and furnished with many tubercles; claw pectinate; tooth on underside of first joint of mandibles. Legs short, coriaceous, robust; second and fourth pairs of nearly equal length; lateral pores on upper margin of cephalothorax distinct, subcircular.

**Mesosoma nigrum** (Say) Weed. Plate V.

*Phalangium nigrum* Say, Journ. Phila. Acad. vi, p. 66, Compl. Writings, ii, p. 14. Wood, Comm. Essex Inst. vi, p. 34.

*Astrobus* (?) *nigrum*, Weed, Amer. Nat. vol. xiv, p. 917.

*Mesosoma nigrum*, Weed, Amer. Nat. xxvi, 529.

*Male*.—Body 6 mm. long; 4 mm. wide; palpi 4 mm. long. Legs: first, 10 mm.; second, 17 mm.; third, 11 mm.; fourth, 16 mm. Black; ventrum of cephalothorax including coxæ, trochanters and base of femora, brown. In some specimens the apical portion of the legs, and more or less of the ground color of the dorsum is brownish black. Dorsum thickly studded with small hemispherical black granules or tubercles. Segmentation of abdominal scutum indicated by faint impressed lines. Eye-eminence longer than high, not canaliculate; covered with black tubercles like those on the dorsum. Palpi black, all the joints slightly arched, robust, with none of the angles prolonged; furnished with more or less scattered black tubercles and spinose hairs; mandibles blackish. Legs short, robust, granulate; ventral surface of abdomen blackish brown, granulate. Genital organ of male "slender, proximally subcylindrical, then flattened and slightly expanded into a broad, somewhat circular, very thin, alate portion, then suddenly contracted and bent at an obtuse angle, ending in a very fine point."

*Female*.—Body 2 mm. long; 5 mm. wide. Palpi 4.5 mm. Legs: first, 10 mm.; second, 17 mm.; third, 11 mm.; fourth, 16 mm. Besides its larger size it differs from the male in having less black on the ventral surface, which is cinnamon-rufous, spotted with black; mandibles brown, black above, and the outer margins of the dorsum of the abdomen smooth without the black tubercles which form a large distinct quadrangular plate on the middle of the abdomen, and a transverse plate on each of the three posterior segments. The smooth margins are brown.

Described from many specimens.

Brookings. This remarkable species seems to be rather common in South Dakota.

**TRACHYRHINUS** Weed, 1892.

Body very hard; dorsum a large plate, with a rough, coarsely punctate surface. Front margin of cephalothorax furnished with two denticulate tubercles. Eye-eminence prominent, with two rows of large tubercles having spinose tips. Legs rather long, thickly beset with spinose tubercles. Pores on margin of cephalothorax rather small, oval; palpal claw smooth; inner distal angle of femur very slightly and of patella quite strongly developed. First joint of mandible furnished with a tooth on lower surface. Second legs decidedly longer than fourth.

**Trachyrhinus favosus** (Wood) Weed.

*Phalangium favosum* Wood, Comm. Essex Institute, vol. vi, pp. 28-29.

*Astrobunus* (?) *favosum* (Wood). Weed, Amer. Nat. vol. xxiv, p. 917.

*Trachyrhinus favosus* (Wood). Weed, Amer. Nat. vol. xxvi, p. 529; Trans. Am. Ent. Soc. xix, 193, pl. 10.

*Male*.—Body 7 mm. long; 5 mm. wide. Legs: first, 21 mm.; second, 40 mm. third, 21 mm.; fourth, 26 mm. Body and members black, more or less mottled with gray; body very hard, dorsum nearly square and quite level, having projecting angles on the anterior lateral corners; grayish, spotted with black, and a faint central marking; coarsely punctate "so as to have a worm-eaten, almost honey-combed appearance." Eye-eminence slender, rather high, light brown, with several robust acute spines, which are at their bases gray, but are tipped with black. Palpi roughened with numerous small blackish spines and spinose hairs; inner distal angle prolonged in a pointed, conical protuberance. Legs stout, thickly beset with spines.

*Female*.—Body 7 mm. long; 4.5 mm. wide; palpi 4 mm. long. Legs: i, 18 mm.; ii, 32 mm.; iii, 17 mm.; iv, 25 mm. Similar to male.

A very peculiar and rather common species. Brookings.

## Subfamily PHALANGINÆ.

Teguments soft or subcoriaceous, not greatly roughened. Segments indicated by striæ, which are often obsolete. Five ventral segments; a single anal piece; two lateral pores easily seen; maxillary lobe of palpus with two tubercles.

The two genera occurring in South Dakota are distinguishable by the character mentioned below.

A tooth on ventral surface of first joint of mandibles.....**Liobunum**.  
No tooth on ventral surface of first joint of mandible.....**Phalangium**.

**LIOBUNUM** C. Koch, 1839.

This genus is defined by Simon practically as follows: Teguments soft or subcoriaceous. Striæ of the cephalothorax and of the three last abdominal segments very distinct; those of the anterior seg-

ments scarcely or not at all distinct (especially in the ♂). Anterior and lateral borders of the cephalothorax smooth. Eye eminence relatively small; smooth, or rarely provided with small, slightly distinct tubercles; widely separated from the cephalic border. Lateral pores small, oval and marginal. Anal piece large, transverse-oval or semi-circular, much wider than long, and much wider than the reflected borders of the eighth segment. Mandibles short, similar in the two sexes; first joint furnished at the base below with an acute tooth. Palpi simple; femur, patella and tibia without any process and without projecting angles; maxillary lobe provided at the base with two strong, conical teeth. Maxillary lobe of the second pair of feet very long, nearly straight from the base, not attenuated, directed mesad nearly horizontally, and united on the ventro-meson to the lobe from the opposite side without forming a sensible angle; the two together lightly arched on the cephalic border, and forming an even curve. Sternal piece large, slightly contracted between the fourth pair of coxæ, gradually enlarging and obtusely truncate cephalad. Feet very long and slender; tibia of the second pair with a few false articulations. Palpal claw denticulate.

The males of the four species so far found in South Dakota may be determined by the following key:

A distinct spur on femur of palpus.....	<b>calcar.</b>
No spur on palpus.....	1.
1.—A distinct black dorsal stripe.....	<b>vittatum.</b>
No distinct black dorsal stripe.....	2.
2.—Dorsum light brown; legs very long; no quadrangular reticulated patch on abdomen.....	<b>longipes aldrichi.</b>
Dorsum mostly blackish; legs moderately long; a quadrangular reticulated patch on abdomen.....	<b>bicolor.</b>

***Liobunum vittatum minor*** new subspecies (Trans. Am. Ent. Soc. xix, plate 12).

*Liobunum vittatum dorsatum* Weed, Am. Nat. xxvi, p. 786.

*Male*.—Body 6 mm. long; 4 mm. wide; palpi, 6 mm. long. Legs: first, 20 mm.; second, 37 mm.; third, 21 mm.; fourth, 30 mm. Femur of first leg 5 mm.; dorsum granulate, in fully colored adults of a deep reddish brown color, with a very distinct black stripe, which begins at the eye eminence expands for a short distance, then contracts until it reaches the cephalic portion of the abdomen, whence it runs with parallel sides a short distance, then very slightly expands until it reaches the caudal third of the abdomen, where it contracts and runs as a stripe to the posterior extremity. Eye eminence of about equal height, length and breadth, sloping slightly backward, black above, lightly canaliculate, with a few (two to five or six) sub-obsolete, acute black tubercles; mandibles light brown, tips of claws black; dorsal surface of second joint sparsely covered with short

spinous hairs. Palpi long, reddish brown, depth of color varying with that of rest of body; tarsus distinctly blackish; femur with a row of short conical tubercles on its outer ventro-lateral surface, commencing near the base and running to the apical extremity, where there are about a dozen similar tubercles on the ventral surface; another short, slightly oblique series on the dorsal surface, beginning at the apical margin and extending backward about one-fourth the length of the femur; patella with a row of tubercles on its outer ventro lateral surface, similar to those on the femur, and a few obsolete ones on its dorsal and ventral surfaces; tibia with two nearly parallel rows of tubercles, one on the ventral and the other on the outer ventro lateral surface; a short row also on the distal portion of its inner ventro-lateral surface; tarsus sparsely covered with stiff hairs, and furnished with a well pronounced row of black tubercles on its inner ventro-lateral surface. Ventrums reddish brown, with more or less of a vermilion tint in some specimens, with well-marked granulations. Legs brownish black or black. Coxæ slightly tuberculate, each having a row of short tubercles on the cephalic margin. Shaft of genital organ slender, bent nearly at right angles near distal end, and terminating in a very acute point.

*Female*.—Body 8 mm. long; 5 mm. wide; palpi 5 mm. long. Legs: first, 22 mm.; second, 41 mm.; third, 23 mm.; fourth, 32 mm. Femur of first leg 6 mm. Differs from the male in having the body thicker and more rounded, and in having less reddish coloring. The palpi are much more slender, shorter, and have the tubercles partially replaced by hairs; the tip of tarsus only is blackish. The ventrum is sometimes grayish. The black central stripe is very distinct.

Described from six specimens (3 ♂, 3 ♀) taken at Brookings, South Dakota.

The male of this subspecies is accurately illustrated in Trans. Am. Ent. Soc. xix, plate 12. Its structural details are shown in fig. 2, which was drawn from a specimen of the typical *Liobunum vittatum* of the Southern States. The idea of the general structural characters of the female may be obtained from plate v, fig. 2, which also represents a typical specimen from the South.

The claims of this form to subspecific rank rest chiefly upon the extreme shortness of the legs and its melanistic tendencies, the latter being indicated by the intense blackness of the central stripe in both sexes; the unusual blackness of the legs of the female; and the blackish palpal tarsus. These characters are constant in and peculiar to the specimens from the general region under consideration.

***Liobunum longipes aldrichi***, new subspecies (Trans. Am. Ent. Soc. xix, pl. 14).

*Male*.—Body 3.8 mm. long; 3 mm. wide; palpi 3.2 mm. long. Legs: first, about 34 mm.; second, 62 mm.; third, about 35 mm.; fourth, 46 mm. Dorsum minutely tuberculate, light reddish brown, with a slightly darker subobsolete central marking, sometimes simply represented by obscure, brown blotches; margins of cephalothorax black. Eye eminence at least as broad as high, black, canaliculate, with rows of small, black tubercles on the carinae. Mandibles

light yellowish brown, tips of claws black; second joint with sparse hairs. Palpi slender, light brown, distal portion of femur and all of patella black; femur, patella and tibia with small scattered tubercles and short hairs; tarsus pubescent, with a row of small, black tubercles on its inner ventro-lateral surface. Ventrum, including coxæ, paler than dorsum, of a nearly uniform, light brown tint; coxæ tuberculate, tips white; trochanters black. Legs long, slender, black or brownish black; generally, though not always, with apical tenth of tibiæ of second pair white. Shaft of genital organ flattened, contracted near its distal extremity and bent upward, terminating in an acute point.

*Female*.—Body 5 mm. long; 3.5 wide. Third legs, 30 mm. long. Body larger and legs shorter than in male. Dorsum mottled brown and black, with a distinct dark central marking, twice interrupted on posterior third of abdomen. Legs brown, with whitish annulations at many of the joints. Palpi colored as in ♂.

The short legs and melanistic tendencies distinguish this subspecies from the normal form in other regions. The blackness of part of the palpal joints, of the eye eminence, and of the margin of the cephalothorax, are all very pronounced.

Named for Mr. J. M. Aldrich.

**Liobunum bicolor** (Wood) Weed.

*Phalangium bicolor* Wood, Comm. Essex Inst. vi, 28.

*Liobunum bicolor* Weed, Am. Nat. xxi, 935; xxvii, 295.

*Male*.—Body 5 mm. long; 3.5 mm. wide; palpi 4 mm. long. Legs: i, 20 mm.; ii, 38 mm.; iii, 21 mm.; iv, 31 mm. Dorsum brownish black, with a faint indication of a lighter central marking, and a large, brown, quadrangular, reticulated patch on the central portion of the dorsum of abdomen, behind which are two other transverse reticulated bands. There are also on the dorsum of the abdomen more or less distinct transverse rows of whitish tubercles with black tips. Eye eminence prominent, brown, lightly canaliculate, with a row of well-developed, acute, brown tubercles on each carina. Mandibles light yellowish brown, smooth, with only a few indistinct whitish hairs. Palpi short, light brown, with femur and patella more or less dusky; all joints except tarsi, with numerous small spinose tubercles; ventral surface, including coxæ, brownish white; a transverse row of minute tubercles on each abdominal segment; coxæ closely tuberculate. Legs light brown, very slender, long; proximal joints with rows of acute conical tubercles.

*Female*.—In this sex there is a large, triangular, reticulated patch on the cephalothorax, the posterior portion including the eye eminence; between this and the quadrangular patch on abdomen is a smooth grayish black space, which is interrupted by a transverse reticulated band.

A rare species. Taken at Brookings and Custer, S. D.

**Liobunum (?) calcar** (Wood) Weed.

*Phalangium calcar* Wood, Comm. Essex Inst. vi, 26.

*Liobunum (?) calcar*, Weed, Am. Nat. xxi, 935.

*Male*.—Body 7.5 mm. long; 4.5 mm. wide. Legs: first, 31 mm.; second, 56 mm.; third, 32 mm.; fourth, 40 mm. Body pyriform. Dorsum reddish brown, minutely tuberculate; some specimens having a faint indication of a central



marking, and scattered light colored spots. Eye eminence of moderate size, of nearly equal height, length and breadth; blackish above; slightly canaliculate, with a row of small, acute tubercles on each carina. Mandibles yellowish brown, with obscure markings of a darker color, especially on the inner dorso-lateral surface of the second joint, where they are arranged in the form of a series of irregular parallelograms; dorsal surface of second joint sparsely clothed with stiff hairs; tips of claws black. Palpi long, very robust; dark reddish brown, lighter distally; femur enlarging from base to apex, with a very robust spur-like process on its outer ventro-lateral surface, near the distal extremity, the anterior edge of which is provided with a row of short black tubercles; dorsal surface of femur with numerous scattered, short, black tubercles, and a few also on the proximal portion of the inner ventro-lateral surface; sparsely provided with spinose hairs; patella short, thick, so united with the femur as to form an arch; with sparse hairs and a few scattered tubercles on its dorsal and outer lateral surfaces; tibia arched, densely clothed with long, black hairs; a patch of short, black tubercles on the proximal portion of its ventral surface, and a short row of similar tubercles on the apical portion of its inner ventro-lateral surface; tarsus terminating with a short, denticulate claw. Ventrums light reddish brown; coxæ reddish, with a few short hairs; two anterior pairs with a row of subobsolete tubercles on the cephalic border. Legs reddish brown, with darker annulations; joints near body having rows of short spines. Shaft of genital organ very robust, flattened, distally contracted and curved, and terminating in a short acute point.

No fully developed specimens of this species were present in the collections at hand, and the above measurements and description are taken from individuals from Illinois and North Carolina. I presume adult Dakota forms will have much shorter legs than the above measurements, and shall not be surprised if they prove sufficiently distinct for a subspecific name.

I have never been able to determine definitely the female of this species. Until this sex is found we shall be unable to say definitely whether the species belongs to *Liobunum* or not.

#### **PHALANGIUM** Linné, 1758.

Teguments soft; dorsum furnished with small, acute tubercles, lateral pores large, elongate-oval; first joint of mandibles with no tooth on lower surface. Palpi simple, sometimes having the inner distal angle of the patella very slightly produced, but never prolonged into a process; claw not pectinate; maxillary lobe of second pair of legs much longer than wide, gradually narrowing from the base to apex, directed obliquely forward. Legs long, more or less robust. Eye eminence of medium size, canaliculate, provided with two series of pointed tubercles.

**Phalangium cinereum** Wood.

*Phalangium cinereum* Wood, Comm. Essex Inst. vol. vi, p. 25; Weed, Amer. Nat. vol. xxvi, p. 32; Trans. Am. Ent. Soc. xix, p. 269, pl. xvi.

*Male*.—Body 7 mm. long; 4.8 mm. wide; palpi 5 mm. long. Legs: first, 29 mm.; second, 51 mm.; third, 29 mm.; fourth, 38 mm. Dorsum ash-gray, sometimes more or less brownish, with a wide, vase-shaped central marking, which is sometimes obsolete. There is a transverse series of small spinose tubercles behind the eye eminence, another row on posterior border of cephalothorax, and one row on each abdominal segment except the last two; a curved series of similar tubercles is found in front of the eye eminence. These tubercles have whitish bases and acute black apices, and generally also have a spinose hair arising on one side near the apex of the white portion and reaching beyond the tip of the tubercle. In front of eye eminence there are two longitudinal series of three each of these tubercles. Lateral borders of cephalothorax subsinuate. Eye eminence low, canaliculate, with a series of five or six tubercles like those on dorsum on each carina. Mandibles brownish white, tips of claws black; second joint and apical portion of first joint furnished with short, black, stiff hairs. Palpi light brown, rather slender, first four joints with minute tubercles and short black hairs; none of the angles prolonged; tarsal joint without tubercles, but with hairs; claw moderately robust. Venter, including coxæ, light grayish brown, with many somewhat quadrangular patches of a more pronounced brown, and scattered blotches of chocolate-brown. Trochanters light brown, with many small tubercles; remaining joints of legs cinnamon-brown, more or less annulated with lighter and deeper shades; angular, with longitudinal rows of black spines; sheath of genital organ subcylindrical, truncate; shaft robust, with two lateral oval openings near distal extremity, then contracted into a blunt scoop-shaped piece, turned upward at nearly a right angle and terminating in a slender, acute point.

*Female*.—Body 8 mm. long; 5 mm. wide; palpi, 5 mm. long. Legs: first, 23 mm.; second, 42 mm.; third, 29 mm.; fourth, 31 mm. Differs from male as follows: Body larger, rounder. Dorsum darker gray, more mottled, central marking more distinct; tubercles on dorsum smaller, those on eye eminence more numerous, and those forming the longitudinal series in front of eye eminence also more numerous. Palpi with hairs, but without tubercles. Legs with annulations more distinct; trochanters without tubercles; spines on femur less prominent, and those on tibia obsolete; narrow quadrangular patches on venter of abdomen arranged in transverse series. Distal joints of ovipositor blackish; about thirty in number.

Brookings, South Dakota.

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### EXPLANATION OF PLATE V.

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Fig. 1.—*Mesozoma nigrum* ♂. Natural size.

" 2.—Parts of same. Magnified.

" 2a.—Body.

" 2b.—Eye eminence. Side view.

" 2c.—Eye eminence. Front view.

" 2d.—Palpus. Side view.

" 2e.—Claw of palpus. Side view.